

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Thomas C. Richards et al.	Art Unit	: 1745
Serial No.	: 10/633,339	Examiner	: Alix Elizabeth Echelmeyer
Filed	: August 1, 2003	Conf. No.	: 4181
Title	: BATTERY		

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Commissioner for Patents

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Alexandria, VA 22313-1450

APPEAL BRIEF ON BEHALF OF THOMAS C. RICHARDS ET AL.

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**(1) Real Party in Interest**

The real party in interest is The Gillette Company, Prudential Tower Building, Boston MA. The Gillette Company was acquired by The Procter & Gamble Company in 2005.

**(2) Related Appeals and Interferences**

The appellant is not aware of any appeals or interferences related to the above-identified patent application.

**(3) Status of Claims**

This is an appeal from the decision of the Primary Examiner in an office action dated July 23, 2009, rejecting claims 1-13, 15, 51-55, 59-70, 83, 85, 87 and 89 all of the claims remaining under consideration in the application. Claims 14, 71-82, 86 and 88 were withdrawn from consideration. Claims 16-50, 56-58 and 84 were previously canceled.

Applicant had previously filed on February 5, 2009, a Reply to the Final Office Action that was dated January 14, 2009. Appellant was informed, via an Advisory Action, that the proposed amendments would not be entered because they allegedly raised new issues. Appellant filed a Supplementary Response on March 9, 2009 canceling the amendments that allegedly raised new issues and also to overcome alleged rejections under 35 U.S.C. 112, first paragraph. These latter amendments placed the claims in the same condition that they existed prior to the action of July 22, 2008 and have been entered by the examiner.

Appellant filed a Notice of Appeal on March 13, 2009 and an appeal brief on April 13, 2009. In response, the examiner reopened prosecution and again rejected claims 1-13, 15, 51-55, 59-70, 83, 85, 87 and 89 in the office action dated July 23, 2009. In a telephonic interview (summarized in a separate paper filed concurrently herewith) conducted on August 7, 2009, the examiner agreed that the currently pending claims overcome the prior art of record. However, the examiner felt that a new search may be needed and requested that Appellant either reply to the action or re-submit the Appeal Brief.

Appellant has elected to resubmit the brief and re-instate the appeal. This Brief also addresses the typographic error regarding the examiner's mis-grouping of claim 12

**Claims 1-13, 15, 51-55, 59-70, 83, 85, 87 and 89 are the subject of this appeal.**

**(4) Status of Amendments**

Appellant filed a Supplementary Reply to the Final Office Action on March 9, 2009 to place the claims in substantially the same form they were in prior to the Office Action dated July 22, 2008.

All previously filed amendments have been entered.

**(5) Summary of Claimed Subject Matter**

Claim 1

Appellant's claim 1 is directed to a battery that includes a battery can "*Disposed between the upper and lower members 12a, 12b is a first cylindrical member 12c that together with the upper and lower members forms the housing 12 or "battery can" for the battery 10.*"<sup>1</sup> The battery can houses a cell that supplies electrical energy at terminals of the cell by an electro-chemical reaction with oxygen "*...a zinc-air cell reduces oxygen according to the following simplified reaction  $O_2 + 4e^- + 2H_2O \rightarrow 4OH^-$ .*"<sup>2</sup>

Inventive features of Appellant's claim 1 include a first member having at least one hole that is exposed to air; "*The cylindrical member 12c has at least one hole, here shown having a plurality of evenly-spaced holes generally 13 arranged in a series of columns along the length of the cylindrical member 12c*"<sup>3</sup>;

Inventive features of Appellant's claim 1 also include a second member; "*The battery 10 includes a second member, e.g., a second cylindrical member 14 coaxially disposed within the first cylindrical member 12c.*"<sup>4</sup>

Inventive features of Appellant's claim 1 also include a mechanism to move a first one of the first and second members. "*The actuator 16 provides a bi-stable latching mechanism for the*

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<sup>1</sup> Appellant's Specification, Page 4, lines 20-22

<sup>2</sup> *Id.*, Page 8, lines 25-28

<sup>3</sup> *Id.*, Page 4, lines 22-24

<sup>4</sup> *Id.*, Page 5, lines 1-2

*moveable one of the cylinders here the second cylinder 14.*”<sup>5</sup> The mechanism includes a member whose shape deforms in response to a current drawn from the battery “*The actuator 16 is comprised of a shape memory alloy material that deforms into a first position with application of a voltage potential ...*”<sup>6</sup> The member is coupled to the first one of the first and second members to move the first one of the first and second members. “*The actuator 16 shown in FIGS. 1, 1A and 1B is a wire coupled between inner sidewalls of the first cylinder 12c ...*”<sup>7</sup> “*The actuator 16 could also be a ribbon (not shown) coupled between the inner sidewalls of the first cylinder 12c and an intermediate member 18 that transfers a higher amount of force to the second cylinder 14.*”<sup>8</sup> When current is drawn from the battery, the member has a first shape that allows air to pass through the opening in the first member into the battery and the member has a second shape that causes the one of the first and second members to move and inhibit air from passing through the opening and into the battery. “*When current is consumed from the battery 10' the ribbons 21 move such that the openings in the cylinder are open allowing air to pass into the battery 10'.*”<sup>9</sup>

#### Claim 51

Appellant's claim 51 is directed to a method of operating a battery. This feature is supported in the same manner as the analogous features of claim 1

Inventive features of claim 51 include controlling a quantity of air that enters a metal-air battery “*...the plurality of holes arranged in a series of columns along the length of the cylindrical member 12c and cylindrical member 14 are in registration or alignment producing through apertures generally 17 in one position allowing air to enter the battery and are not in registration is a second position shutting out air from entering the battery 10, ...*”<sup>10</sup>

Inventive features of claim 51 also include passing current through a member; “*As current flows through the wire the wire is heated, which can be used to change the shape of the*

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<sup>5</sup> *Id.*, Page 5, lines 29-30

<sup>6</sup> *Id.*, Page 5, lines 30-31

<sup>7</sup> *Id.*, Page 6, lines 6-7

<sup>8</sup> Appellant's Specification, Page 6, lines 21-23

<sup>9</sup> *Id.*, Page 7, lines 14-16

<sup>10</sup> *Id.*, Page 5, lines 9-12

wire.”<sup>11</sup> coupled to a first cylindrical member and a second cylindrical member to move one of the first cylindrical member and the second cylindrical member from a first position to a second position. This feature is supported by FIGS. 1, 1A and 1B and 2, 2A and 2B. The first cylindrical member has at least one hole that is exposed to air, with the second position providing the at least one hole in the first cylindrical member in registration with at least a second hole in the second cylindrical member. This feature is supported in the same manner as the analogous features of claim 1. When current is not drawn from the battery the member causes one of the first cylindrical member and the second cylindrical member to return to the first position such that the holes are not in registration inhibiting air to pass into the battery. *“When current is not being drawn from the battery, the ribbons 21 move such that the holes 13 in the cylinder 12c are closed to inhibit air from passing into the battery 10”.*<sup>12</sup>

#### Claim 59

Appellant's claim 59 is directed to a battery. This feature is supported in the same manner as the analogous features of claim 1.

Inventive features of claim 59 include a battery can housing a cell that supplies electrical energy at terminals of the cell by an electro-chemical reaction with oxygen. This feature is supported in the same manner as the analogous features of claim 1. The can includes a first cylindrical member having at least one hole. This feature is supported in the same manner as the analogous features of claim 1. The can further includes a second cylindrical member having at least one hole. *“The second cylindrical member 14 has at least one hole, here shown having a plurality of evenly-spaced holes generally 15 arranged in a series of columns along the length of the cylindrical member 14.”*<sup>13</sup>

Inventive features of claim 59 also include a member coupled to one of the first and second cylindrical members to move one of the first and second cylindrical members such that when current is drawn from the battery, the holes in the first and second cylindrical members are in registration to allow air to pass into the battery and to move the one of the first and second

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<sup>11</sup> *Id.*, Page 6, lines 17-18

<sup>12</sup> *Id.*, Page 7, lines 16-18

<sup>13</sup> *Id.*, Page 5, lines 2-4

cylindrical members such that when current is not drawn from the battery, the holes in the first and second cylindrical members are not in registration to inhibit air to pass into the battery. These features are supported in the same manner as the analogous features of claim 51.

### Claim 83

Appellant's claim 83 is directed to a method of operating a battery. This feature is supported in the same manner as the analogous features of claim 1.

Inventive features of claim 83 include controlling a quantity of air that enters a metal-air battery "...the plurality of holes arranged in a series of columns along the length of the cylindrical member 12c and cylindrical member 14 are in registration or alignment producing through apertures generally 17 in one position allowing air to enter the battery and are not in registration in a second position shutting out air from entering the battery 10,..."<sup>14</sup>

Inventive features of claim 83 also include passing current through a member, "As current flows through the wire the wire is heated, which can be used to change the shape of the wire."<sup>15</sup> to move a first member. The member is mechanically coupled to the first member and moves the first member relative to a second member. These features are supported at least by FIGS. 1, 1A and 1B and 2, 2A and 2B. The second member has at least one hole that is exposed to air. This feature is supported in the same manner as the analogous features of claim 1.

When current is consumed from the battery, the hole in the second member is opened to permit air to flow through the hole into the battery. "When current is consumed from the battery 10' the ribbons 21 move such that the openings in the cylinder are open allowing air to pass into the battery 10'."<sup>16</sup>

When current is not flowing through the member, the member causes the first member to move inhibiting air from flowing through the hole into the battery. "When current is not being drawn from the battery, the ribbons 21 move such that the holes 13 in the cylinder 12c are closed to inhibit air from passing into the battery 10'."<sup>17</sup>

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<sup>14</sup> *Id.*, Page 5, lines 9-12

<sup>15</sup> *Id.*, Page 6, lines 17-18

<sup>16</sup> *Id.*, Page 7, lines 14-16

<sup>17</sup> *Id.*, Page 7, lines 16-18

**(6) Grounds of Rejection to be Reviewed on Appeal**

1. Claims 1-8, 15, 51-55, 59-68, 83, 85, 87 and 89 stand rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (U.S. Patent No. 6,955,187).
2. Claims 13, 69 and 70 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson.
3. Claims 9-12 stand under 35 U.S.C. 103(a) as being unpatentable over Johnson and Brotz (U.S. Patent no. 5,588,295).

**(7) Argument**

Anticipation

"It is well settled that anticipation under 35 U.S.C. §102 requires the presence in a single reference of all of the elements of a claimed invention." *Ex parte Chopra*, 229 U.S.P.Q. 230, 231 (BPA&I 1985) and cases cited.

"Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim." *Connell v. Sears, Roebuck & Co.*, 220 U.S.P.Q. 193, 198 (Fed. Cir. 1983).

"This court has repeatedly stated that the defense of lack of novelty (i.e., 'anticipation') can only be established by a single prior art reference which discloses each and every element of the claimed invention." *Structural Rubber Prod. Co. v. Park Rubber Co.*, 223 U.S.P.Q. 1264, 1270 (Fed. Cir. 1984), citing five prior Federal Circuit decisions since 1983 including *Connell*.

In a later analogous case the Court of Appeals for the Federal Circuit again applied this rule in reversing a denial of a motion for judgment n.o.v. after a jury finding that claims were anticipated. *Jamesbury Corp. v. Litton Industrial Prod., Inc.*, 225 U.S.P.Q. 253 (Fed. Cir. 1985).

After quoting from *Connell*, "Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim," 225 U.S.P.Q. at 256, the court observed that the patentee accomplished a constant tight contact in a ball valve by a lip on the seal or ring which interferes with the placement of the ball. The lip protruded into the area where the ball will be placed and was thus deflected after the ball was assembled into the valve. Because of this constant pressure, the patented valve was described as providing a

particularly good seal when regulating a low pressure stream. The court quoted with approval from a 1967 Court of Claims decision adopting the opinion of then Commissioner and later Judge Donald E. Lane:

[T]he term "engaging the ball" recited in claims 7 and 8 means that the lip contacts the ball with sufficient force to provide a fluid tight seal \*\*\*\* The Saunders flange or lip only sealingly engages the ball 1 on the upstream side when the fluid pressure forces the lip against the ball and never sealingly engages the ball on the downstream side because there is no fluid pressure there to force the lip against the ball. The Saunders sealing ring provides a compression type of seal which depends upon the ball pressing into the material of the ring. \*\*\* The seal of Saunders depends primarily on the contact between the ball and the body of the sealing ring, and the flange or lip sealingly contacts the ball on the upstream side when the fluid pressure increases. 225 U.S.P.Q. at 258.

Relying on *Jamesbury*, the ITC said, "Anticipation requires looking at a reference, and comparing the disclosure of the reference with the claims of the patent in suit. A claimed device is anticipated if a single prior art reference discloses all the elements of the claimed invention as arranged in the claim." *In re Certain Floppy Disk Drives and Components Thereof*, 227 U.S.P.Q. 982, 985 (U.S. ITC 1985).

#### Obviousness

"It is well established that the burden is on the PTO to establish a prima facie showing of obviousness, *In re Fritsch*, 972 F.2d. 1260, 23 U.S.P.Q.2d 1780 (C.C.P.A., 1972)."

In *KSR Intl. Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007), the Supreme Court reversed a decision by the Court of Appeal's for the Federal Circuit decision that reversed a summary judgment of obviousness on the ground that the district court had not adequately identified a motivation to combine two prior art references. The invention was a combination of a prior art repositionable gas pedal, with prior art electronic (rather than mechanical cable) gas pedal position sensing. The Court first rejected the "rigid" teaching suggestion motivation (TSM) requirement applied by the Federal Circuit, since the Court's obviousness decisions had all



advocated a “flexible” and “functional” approach that cautioned against “granting a patent based on the combination of elements found in the prior art.”

In *KSR* the Supreme Court even while stating that: “the Court of Appeals drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias,” warned that: “a factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.”

The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U. S., at 36 (warning against a “temptation to read into the prior art the teachings of the invention in issue” and instructing courts to “guard against slipping into the use of hindsight” (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.

With respect to the genesis of the TSM requirement, the Court noted that although “As is clear from cases such as *Adams*<sup>18</sup>, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.”

“The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.” *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the

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<sup>18</sup> United States v. Adams, 383 U. S. 39, 40 (1966)

[claimed] structure, "[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Laskowski*, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989).

"The claimed invention must be considered as a whole, and the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination." *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 U.S.P.Q. 481, 488 (Fed. Cir. 1984).

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (emphasis in original, footnotes omitted).

"The critical inquiry is whether 'there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" *Fromson v. Advance Offset Plate, Inc.*, 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985).

**(1) Claims 1-8, 15, 51-55, 59-68, 83, 85, 87 and 89  
are not anticipated by Johnson.**

Claims 1-8 and 15

For the purposes of this appeal only, Claims 1-8 and 15 stand or fall together.  
Appellant's claim 1 is representative of this group of claims.

Claim 1 recites the feature of: "a mechanism, to move a first one of the first and second members... comprising a member whose shape deforms in response to a current drawn from the battery, the member ... to move the first one of the first and second members ... when current is drawn from the battery ... allows air to pass through the opening in the first member ... and the member has a second shape that causes the one of ... members to move and inhibit air from passing ... into the battery." The Examiner argued:

Regarding claims 1-3, 51-53 and 59-61, Johnson teaches a battery having a control valve for controlling airflow into the battery. The control portion is made of two cylindrical sleeves, or members, having holes, that can be moved into or out of registration depending on whether air is required for the cell. The movement is controlled by actuators that are attached to the cylinders (abstract; Figure 1; column 3 lines 9-11). Further, Johnson teaches that the current required to induce a shape change in the actuators is generated by electricity from the electrochemical cell (column 4 lines 15-17).<sup>19</sup>

Claim 1 is neither described nor suggested by Johnson at least because Johnson requires two actuator members, relying on one of the actuator members to open the air valve and the other actuator member to close the air valve. As described by Johnson:

Actuator mechanism 29 comprises a pair of an "on" actuator element 34 and an "off" actuator element 36 (FIGS. 7-10). Both actuator elements are comprised of a wire, or pair of wires, formed of a shape memory alloy (also called SMA) material.<sup>20</sup>

Appellant's claim 1 also requires "... a member whose shape deforms in response to current drawn from the battery. Claim 1 also requires that the member has a first shape that allows air to pass ... and a second shape that ... inhibits air from passing through the opening."

Appellant accomplishes with one shape changing member what is required by two members of Johnson. Johnson neither describes a shape changing member, nor does Johnson describe a member that changes shape in response to a current flow from the battery. Johnson describes to construct the pair of actuators from "shape memory alloys,"<sup>21</sup> but neither describes nor suggests a shape changing member that controls one of the first and second members to pass and inhibit air into the battery.

Accordingly, claim 1 cannot be anticipated by Johnson because Johnson does not include all of the features of claim 1, arranged as in claim 1, namely one member that accomplishes what Johnson requires two members to accomplish, in a fundamentally different manner.

In the Office Action dated 07/22/2008, the Examiner agreed that Johnson discloses two actuators, but argued that "...the actuator mechanism of Johnson, having two actuators and a rod attaching the actuators to the first and second members, is considered a member whose shape deforms in the

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<sup>19</sup> Office Action dated July 28, 2008, Pages 2,3

<sup>20</sup> Johnson, Col. 3, lines 55-59

<sup>21</sup> *Id.*, Col. 3, lines 55-60

context of the instant claims.” Appellant disagrees. What is described in Johnson is a mechanism that has two members. The Examiner misconstrues the mechanism of Johnson as “a member” precisely because the examiner is unable to find any teaching in the prior art that satisfies the language of claim 1, namely “a member whose shape deforms in response to a current drawn from the battery, the member being coupled to the first one of the first and second members.”

This construction given to the mechanism described by Johnson is unreasonable when one considers how Johnson describes and illustrates the mechanism.

Accordingly Johnson does not describe all of the features of claim 1 arranged as in claim 1 and therefore Johnson cannot anticipate claim 1.

In a telephone interview conducted on August 7, 2009, the Examiner agreed that Johnson does not describe all the features of claim 1.

#### Claims 51-53

For the purposes of this appeal only, Claims 51-53 stand or fall together. Appellant's claim 51 is representative of this group of claims.

Claim 51 recites “passing current through a member ... to move one of the first cylindrical member and the second cylindrical member from a first position to a second position, ... providing the at least one hole in the first cylindrical member in registration with at least a second hole in the second cylindrical member and when current is not drawn from the battery the member causing the one ... to return to the first position such that the holes are not in registration inhibiting air to pass into the battery.”

Appellant contends that Johnson neither discloses nor suggests at least the foregoing features of claim 51. In stark contrast, Johnson requires current flow through a cell for an “OFF” actuator to bring slots out of registration to occlude fluid flow into the cell. The functioning of the “OFF” actuator is initiated by changing a position of a load switch 48 which causes current from a cell 12 to flow through the “OFF” actuator wire.<sup>22</sup> Johnson clearly describes that a current flow through the cell 12 is required to initiate a transition from the ON state to the OFF state:

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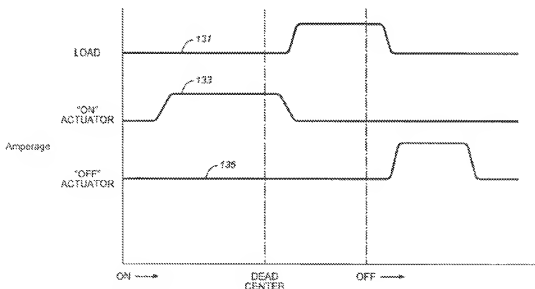
<sup>22</sup> Johnson, Fig. 9

Transition from the on to the off states is initiated by changing load switch 48 to the position shown in FIG. 9. Current flow is via the lines that are shown in wave form, that is from cell 12 through the load switch contact 58, then through contact 80 of "off" actuator wire 36 which begins to heat, then out through terminal 88 of wire 36, then through line 129 and control switch contact 109 across to blade contact 103, and then through the rod and line 123 back to the cell. (emphasis added)<sup>23</sup>

Not only does Johnson describe a current flow through the cell to go from the on state to the off state, but Johnson also requires that such a transition is initiated by changing a position of a load switch. Therefore, Johnson clearly fails to disclose or suggest a member that causes "...one of the first cylindrical member and the second cylindrical member to return to the first position such that the holes are not in registration inhibiting air to pass into the battery" when "current is not drawn from the battery."

In the Advisory Action dated 02/27/2009, the Examiner perfunctorily dismisses the Appellant's argument allegedly showing evidence from Johnson that no current is drawn from the battery when the member is "moving positions." The examiner states: "**Applicant is directed to Figure 11, and column 6, lines 11-16. It is seen in Figure 11 that, when the member is moving positions, no current is drawn from the battery.**" Appellant disagrees and contends that neither of the cited portions supports the reasoning of the Examiner.

Figure 11 of Johnson is reproduced below for convenience.



<sup>23</sup> *Id.*, Col. 5, line 61 – Col. 6, line 2

**FIG. 11**

In stark contrast to the unsupported reasoning of the Examiner, Fig 11 of Johnson shows current being drawn via the off actuator when the load current is switched off. Indeed, this current activates the off actuator to bring the slots out of registration and inhibit the flow of air into the cell. As described by Johnson:

...when "off" actuator wire 36 is activated it contracts in tension and produces a pulling force between the outer sleeve and inner sleeve ends. This pulling force causes the inner sleeve to move down relative to the outer 35 sleeve as viewed in FIG. 7, which in turn moves the slots out of register to close the flow path.<sup>24</sup>

Appellant submits Johnson neither describes nor suggests the foregoing features of claim 51.

In the telephonic interview conducted on August 7, 2009, the examiner agreed that Johnson does not describe or suggest at least the foregoing features of claim 51.

#### Claims 54-55

For the purposes of this appeal only, Claims 54-55 stand or fall together. Appellant's claim 54 is representative of this group of claims.

Claim 54 requires that moving includes "passing a current through a member comprised of a shape memory alloy material to change the shape of the member and effect movement of the first cylindrical member." Johnson does not change the shape of either of the actuator members. Therefore, Johnson cannot anticipate this feature.

#### Claims 59-65, 67 and 68

For the purposes of this appeal only, Claims 59-65, 67 and 68 stand or fall together. Appellant's claim 59 is representative of this group of claims.

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<sup>24</sup> Johnson, Col. 4, lines 31-36

Claim 59 recites a member "...to move the one of the first and second cylindrical members such that when current is not drawn from the battery, the holes in the first and second cylindrical members are not in registration to inhibit air to pass into the battery." Claim 59 distinguishes over Johnson for at least the reasons mentioned with respect to claim 51.

In the telephonic interview conducted on August 7, 2009, the examiner agreed that Johnson does not describe or suggest at least the foregoing features of claim 59.

#### Claim 66

Claim 66 depends indirectly on claim 59 (through its dependence on claim 65) and distinguishes over Johnson at least because Johnson does not disclose or teach "...the actuator is coupled to a circuit that draws power during a change of state allowing the circuit to minimize drain on the battery."

With respect to claim 66, the Examiner states : "Johnson teaches that when the valve is in the fully off position, no current flows from the cell to the wire actuator" The Examiner merely points to the end effect achieved by Johnson and fails to provide any evidence that Johnson teaches the foregoing feature of claim 66. Appellant submits that Johnson has no teachings with respect to drawing power during a change of state allowing the circuit to minimize the drain on the battery.

#### Claims 83 and 85

For the purposes of this appeal only, Claims 83 and 85 stand or fall together. Appellant's claim 83 is representative of this group of claims.

Claim 83 recites "...when current is not flowing through the member, the member causes the first member to move inhibiting air from flowing through the hole into the battery." Johnson fails to disclose or suggest at least the foregoing feature of claim 83. Indeed, as shown above with respect to claim 51, Johnson requires a current flow through the off actuator to make the members go out of registration in order to stop air flow through the battery. Claim 83 thus distinguishes over Johnson for at least analogous reasons mentioned with respect to claim 51.

In the telephonic interview conducted on August 7, 2009, the examiner agreed that Johnson does not describe or suggest at least the foregoing features of claim 83.

### Claims 87 and 89

These claims which depend directly from claim 83 are allowable for analogous reasons as given for claims 54 and 55 because Johnson neither describes nor suggests "passing a current through an actuator comprised of a shape memory alloy material to change the shape of the member and effect movement of the first member."

### **(2) Claims 13, 69 and 70 are not obvious over Johnson**

For the purposes of this appeal only claims 13, 69 and 70 stand or fall together. Claim 13 is representative of this group.

Claim 13 distinguishes over Johnson at least because Johnson does not teach "the actuator is a ribbon, ... the first and second members are coaxially disposed cylinders each having a plurality of openings arranged in a column along the length of the cylinders." The examiner acknowledged this, but contends that it would have been an obvious design choice to modify the wire of Johnson to use a ribbon. **"It would have been an obvious matter of design choice to use a ribbon or a wire, since such a modification would have involved a mere change in the shape of the component."**<sup>25</sup> Appellant disagrees. The Examiner fails to provide a reasonable motivation for modifying the wire of Johnson to be a ribbon and merely states that **"A change in shape is generally recognized as being within the level of ordinary skill in the art. MPEP 2144.04 (IV B)"**<sup>26</sup>

The section in MPEP referred to by the Examiner states<sup>27</sup>: *"In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (The court held that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.)." Appellant submits that the ribbon, as recited in claim 13, serves the purpose of providing added force for the actuator member to move one of the cylinders thus shutting out air from entering the battery. As described in Appellant's specification:<sup>28</sup>

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<sup>25</sup> Office Action dated 7/22/2008, Page 4

<sup>26</sup> *Id.*, Page 4

<sup>27</sup> MPEP, 2144.04 (IV B)

<sup>28</sup> Appellant's Specification, Page 7, lines 2-8



The actuator 16 could also be a ribbon (not shown) coupled between the inner sidewalls of the first cylinder 12c and an intermediate member 18 that transfers a higher amount of force to the second cylinder 14. In addition, on the bottom of the battery can be a restoring spring (not shown) that provides a mechanical force that tends to restore the second cylinder 14 to its resting position to assist in closing the air valve.<sup>29</sup>

On the other hand, the wires in Johnson simply act as conductors which are heated up as a part of an actuator mechanism but do not change shape to allow or inhibit air from passing into the battery. Therefore, there is no motivation for one of ordinary skill in the art to modify the wires of Johnson to use ribbons instead. Rather, heating up a pair of ribbons instead of a pair of wires could consume more energy and hence deter one of ordinary skill in the art to replace the wire in Johnson with a ribbon. Appellant's arrangement does not suffer from this problem at least because only one actuator member is needed to open and close the air valve, and that energy is only consumed in one of the states (typically when the air valve is opened.) In contrast, the use of the ribbon in claim 13 adds the advantage of providing more force when changing the shape of the actuator.

Therefore, claims 13, 69 and 70 clearly distinguish over Johnson at least for the foregoing reasons.

### **(3) Claims 9-12 are not obvious over Johnson and Brotz**

For the purposes of this appeal only claims 9-11 stand or fall together. Appellant's claim 9 is representative of this group of claims. Since Brotz is directed only to an actuator, Brotz does not cure any deficiency of Johnson with respect to the features of claim 1. Therefore claim 9 distinguishes over a combination of Johnson and Brotz for at least the reasons mentioned with respect to claim 1.

Further, neither Johnson nor Brotz discloses or suggests the actuator is a wire with the wire changing between a convex shape and a concave shape to change the position of the second cylinder. Rather, Brotz describes an actuator that has strips of three different metals<sup>30</sup>:

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<sup>29</sup> *Id.*, page 6, lines 21-25.

<sup>30</sup> Brotz, Col. 2, lines 48-55

**In FIG. 1 it can be seen that first arcuate strip 10 composed of memory metal has convex side 12 and 50 concave side 14. Second arcuate strip 20 of memory metal has convex side 22 and concave side 24, having a bend opposite that of first arcuate strip 10. Straight central strip 30, having electrically conductive or semiconductive properties of opposite transport sign from that of the first and second arcuate strips, has first side 32 and second side 34.**

#### Claim 12

Claim 12 further distinguishes over Johnson because Johnson fails to disclose or suggest a member coupled between an upper end portion of the second member and a ribbon to transfer a force generated by the ribbon to the second member. In the Office Action dated 07/22/2008, the Examiner cites Figures 5 and 6 of Johnson to recite the foregoing feature of claim 12. Appellant disagrees. The cited figures of Johnson show a connection between an actuator mechanism and a valve sleeve but do not disclose or suggest a member connected between a second member and a ribbon.

Therefore, Appellant contends that claims 9-12 distinguish over a combination of Johnson and Brotz.

#### **Conclusion**

Appellant submits that claims 1-13, 15, 51-70, 83, 85, 87 and 89 are allowable over the art in view of the arguments set forth above. Therefore, the Examiner erred in rejecting Appellant's claims and should be reversed.

Respectfully submitted,

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### **Appendix of Claims**

1. A battery comprises:  
a battery can housing a cell that supplies electrical energy at terminals of the cell by an electro-chemical reaction with oxygen, the can including:  
a first member having at least one hole that is exposed to air; and  
a second member; and  
a mechanism, to move a first one of the first and second members, the mechanism comprising:  
a member whose shape deforms in response to a current drawn from the battery, the member being coupled to the first one of the first and second members to move the first one of the first and second members such that when current is drawn from the battery, the member has a first shape that allows air to pass through the opening in the first member into the battery and the member has a second shape that causes the one of the first and second members to move and inhibit air from passing through the opening and into the battery.
2. The battery of claim 1 wherein the first and second members are coaxially disposed cylinders each having at least one opening that are placed in and out of registration to allow or inhibit air from passing into the battery.
3. The battery of claim 1 wherein the first and second members are coaxially disposed cylinders each having a plurality of openings.
4. The battery of claim 1 wherein the first and second members are coaxially disposed cylinders each having a plurality of openings arranged in a column along the length of the cylinders.

5. The battery of claim 1 wherein the first and second members are cylindrical members and the member is coupled to the second cylindrical member that is coaxially disposed within the first cylindrical member.

6. The battery of claim 1 wherein the member is an actuator comprised of a shape memory alloy material.

7. The battery of claim 1 wherein the member is an actuator comprised of a high force, low displacement shape memory alloy (SMA).

8. The battery of claim 7 wherein the actuator is coupled to a circuit, and the circuit only draws power during a change of state allowing the circuit to minimize drain on the battery.

9. The battery of claim 6 wherein the actuator is a wire with the wire changing between a convex shape and a concave shape to change the position of the second cylinder.

10. The battery of claim 9 further comprising a member coupled between an upper end portion of the second member and the wire to transfer a force generated by the wire to the second member.

11. The battery of claim 6 wherein the actuator is a ribbon with the ribbon changing between a convex shape and a concave shape to change the position of the second cylinder.

12. The battery of claim 11 further comprising a member coupled between an upper end portion of the second member and the ribbon to transfer a force generated by the ribbon to the second member.

13. The battery of claim 6 wherein the actuator is a ribbon, wherein the first and second members are coaxially disposed cylinders each having a plurality of openings arranged in a column along the length of the cylinders.

Claim 14 is withdrawn.

15. The battery of claim 6 wherein the first and second members are coaxially disposed cylinders each having a plurality of openings arranged in a column along the length of the cylinders.

Claims 16-50 are canceled.

51. A method of operating a battery, the method comprises:  
controlling a quantity of air that enters a metal-air battery by:  
passing current through a member coupled to a first cylindrical member and a second cylindrical member, to move one of the first cylindrical member and the second cylindrical member from a first position to a second position, the first cylindrical member having at least one hole that is exposed to air, with the second position providing the at least one hole in the first cylindrical member in registration with at least a second hole in the second cylindrical member and when current is not drawn from the battery the member causing the one of the first cylindrical member and the second cylindrical member to return to the first position such that the holes are not in registration inhibiting air to pass into the battery.

52. The method of claim 51 wherein the hole in the first and second cylindrical members is a first hole and each of the first and second cylindrical members have a plurality of holes including the first hole.

53. The method of claim 52 wherein the first and second cylindrical members are coaxially disposed and the holes in each of the cylindrical members are arranged in a column along the length of the cylindrical members.

54. The method of claim 51 wherein moving comprises:  
passing a current through a member comprised of a shape memory alloy material to change the shape of the member and effect movement of the first cylindrical member.

55. The method of claim 54 wherein the member is an actuator comprised of a high force, low displacement shape memory alloy (SMA).

Claims 56-58 are canceled.

59. A battery comprises:  
a battery can housing a cell that supplies electrical energy at terminals of the cell by an electro-chemical reaction with oxygen, the can including:  
a first cylindrical member having at least one hole;  
a second cylindrical member having at least one hole; and  
a member coupled to one of the first and second cylindrical members to move one of the first and second cylindrical members such that when current is drawn from the battery, the holes in the first and second cylindrical members are in registration to allow air to pass into the battery and to move the one of the first and second cylindrical members such that when current is not drawn from the battery, the holes in the first and second cylindrical members are not in registration to inhibit air to pass into the battery.

60. The battery of claim 59 wherein the first and second cylindrical members are coaxially disposed each having at least one opening that are placed in and out of registration to allow or inhibit air from passing into the battery.

61. The battery of claim 59 wherein the first and second cylindrical members are coaxially disposed each having a plurality of openings that are placed in and out of registration to allow or inhibit air from passing into the battery through the plurality of openings.

62. The battery of claim 59 wherein the first and second cylindrical members are coaxially disposed and each has a plurality of openings arranged in a column along the length of the cylindrical members.

63. The battery of claim 59 wherein the first and second cylindrical members are coaxially disposed and the member is coupled to the second cylindrical member that is coaxially disposed within the first cylindrical member.

64. The battery of claim 59 wherein the member is an actuator comprised of a shape memory alloy material.

65. The battery of claim 59 wherein the member is an actuator comprised of a high force, low displacement shape memory alloy (SMA).

66. The battery of claim 65 wherein the actuator is coupled to a circuit that draws power during a change of state allowing the circuit to minimize drain on the battery.

67. The battery of claim 64 wherein the actuator is a wire.

68. The battery of claim 67 further comprising a member coupled between an upper end portion of the second member and the wire to transfer a force generated by the wire to the second member.

69. The battery of claim 64 wherein the actuator is a ribbon.

70. The battery of claim 69 further comprising a member coupled between an upper end portion of the second member and the wire to transfer a force generated by the wire to the second member.

Claims 71-82 are withdrawn.

83. A method of operating a battery, the method comprises:  
controlling a quantity of air that enters a metal-air battery by:  
passing current through a member to move a first member mechanically coupled to the first member relative to a second member having a least one hole that is exposed to air, such that when current is consumed from the battery, the hole in the second member is opened to permit air to flow through the hole into the battery and when current is not flowing through the member, the member causes the first member to move inhibiting air from flowing through the hole into the battery.

Claim 84 is canceled.

85. The method of claim 83 wherein first and second members are cylindrical members.

Claim 86 is withdrawn.

87. The method of claim 83 wherein moving comprises:  
passing a current through an actuator comprised of a shape memory alloy material to change the shape of the member and effect movement of the first member.

Claim 88 is withdrawn.



89. The method of claim 83 wherein the actuator is attached to the first member is and is comprised of a high force, low displacement shape memory alloy (SMA).

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## **Evidence Appendix**

None

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### **Related Proceedings Appendix**

None